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Nursing Staff Compliance with Hand Hygiene Protocol in NICU in Regional Perinatal Center

Xiaoping Wu

Background

Neonates admitted to NICU are particularly at risk for health care associated infections due to the immaturity of their immune system and defense mechanisms and the frequent use of central lines and invasive procedures. Adherence to hand hygiene protocols has long been recognized as a key factor in preventing and decreasing hospital acquired infections by reducing horizontal transmission, patient skin colonization and sterile site contamination with pathogenic flora. Proactive programs for staff education have been shown to improve compliance with infection control protocols. Ongoing surveillance may provide information for targeted interventions to increase compliance.

Objectives

To compare the adherence to hand hygiene protocol before and after the introduction of individual bedside alcohol-based hand sanitizers; to determine whether hand hygiene practices differ between levels of touch; to determine the effect of staff education on compliance; to elucidate possible reasons for non-adherence.

Methods

Hand hygiene practices of nursing staff in the NICU were observed by two students over 30 consecutive days and compared with previous observations, before and after the introduction of bedside waterless hand sanitizers. The current observations were categorized into three levels of touch: touching the patient's immediate environment outside the isolette (Level 1), touching inside the isolette but not the patient (Level 2), and touching the patient both directly (Level 3) and after patient contact. For each level of touch, the hand hygiene practices were organized into the following groups: clean hands with no gloves, clean hands with gloves, unclean hands with gloves, and unclean hands with no gloves. For patient touches in which no hand hygiene was practiced, it was also noted whether the touch was made during routine care or in an emergency. Compliance with hand hygiene was also observed after information on the importance of hand hygiene in infection prevention as well as our current compliance rates was presented to the nursing staff and compared to pre-education rates.

Results

A total of 771 observations on hand sanitizer use before and after patient contact and 208 observations for level of touch were made. Adherence increased significantly since the introduction of waterless individual bedside hand sanitizers: 73% vs. 80% before and 83% vs. 90% after patient contact ($p < .01$). Pre-education hand hygiene was practiced least with Level 1 touches and more with Level 2 and 3 touches: 67%, 89% and 85%, respectively. The most utilized hand hygiene techniques were clean hands or clean hands plus gloves. Of the missed opportunities for infection control (gloves only or no disinfection nor gloves), 69% occurred dur-

ing routine procedures. There was significantly higher protocol adherence after patient contact. During this cycle of observations, there was an overall lower protocol adherence before and after patient contact as compared with the previous 6 months of 2008, which in part maybe explained by the higher nurse to patient ratio. After education, compliance rates increased across all levels of touch with a 33% increase for Level 1 touches ($p < .005$).

	Before Education		After Education	
	Percentage Hand Hygiene Compliance	Percentage of Noncompliance during routine procedure	Percentage Hand Hygiene Compliance	Percentage of Noncompliance during routine procedure
Level I	67%	100%	100%	0%
Level II	89%	50%	97%	100%
Level III	85%	46%	90%	60%

Conclusions

As reported by others, we observed that hand disinfection in health care settings is not always practiced. Staff education and bedside waterless hand sanitizers produced a significant improvement. The suboptimal adherence to the hand hygiene protocol could not be fully explained by the emergency nature of patient contact, suggesting that time and convenience are not the main concerns that infection control needs to address. Incomplete hand hygiene with Level 1 touches may contribute to patient colonization with pathogenic hospital environment flora. The system improvement should focus on providing the tools for perfect hygiene, on optimizing staff education and on improving staff motivation. Ongoing surveillance of adherence is essential to infection control practices. Furthermore, we should strive to find the right balance between system improvement strategies and implementation of personal accountability.

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